2010

The Seed

Bob Henrickson

Justin Evertson

The Seed

A Publication of the Nebraska Statewide Arbore-

Groundcovers—Nature's Living

By Bob Henrickson

Too often, groundcovers are not considered when new landscape plantings are installed. Traditionally, the soil surface of new planting beds that incorporate trees, shrubs and herbaceous perennials is covered with a 2-3" layer of organic mulch. The organic mulch helps to conserve moisture, control weeds and give the landscape a uniform, finished look. However, it usually takes a number of years before the plants mature, prompting a yearly top-dressing of mulch to keep the open areas covered. This yearly addition of mulch can be relatively expensive and excessive mulch can build up on the soil. It can also be a lot of work to mulch between plants. The dense carpet of leaves, intertwining stems and abundant roots of living mulch can function in many of the same ways as traditional mulches. Moreover, the constant growing, dying and breakdown of living mulch will help build a healthy nutrient rich soil over time.

The list of available ground-covers has grown exponentially in recent years, finally giving us some relief from tired old has-beens like Hall's honeysuckle and dragon's blood sedum. The incredible variety of groundcover offerings—woody or herbaceous; limbing, clumping or running; evergreen or deciduous—in all kinds of colors, textures and fragrances, leaves an array of possibilities for use as living mulch.

Mulch rings around trees are usually kept to a minimum size to reduce maintenance upkeep. Under-planting trees within the mulch zone is a good way to use groundcovers, and a good way to expand the mulch bed around the tree. By planting around trees, the trunks will not be injured by being scraped with a lawn mower. It also eliminates the need for having to trim around trees. Plants provide seasonal interest and reduce the need for conventional mulches. But, be warned: Some of these pretty plants pack a powerful punch and will invade everything near it. Ask before you buy. The aggressive groundcovers can be kept in check by planting in a confined bed or between dense upright perennials or shrubbery or growing along a mowed edge.

Groundcovers can greatly reduce the need for weed-

Try planting a combination of creeping groundcovers in small groups, where one is allowed to slowly weave its way into the edge of another. In this case it's important to choose plants that will grow and spread at about the same rate. For example, sweet woodruff and ajuga for shade or snow-in-summer and leadwort in sun.

Groundcover Alternatives for the

By Justin Evertson

Turfgrass is by far the most dominating groundcover in our lives. In fact, it is now estimated that we are approaching 50 million acres of turf in this country (Amy Vickers, *Handbook of Water Conservation*, 2001). Although turfgrass has many benefits, visual appeal remains the primary reason for its widespread use. People just seem to connect to the look of a green lawn, as if it were a living carpet radiating from our homes, businesses and public places. Another great benefit of turfgrass is its ability to withstand foot traffic, which is no small advantage in the community landscape. There really is no better surface for field sports, kite flying, dog chasing, picnicking, tent camping and numerous other things people like to do outside.

Over the last half century, the American lawn has evolved into something that is now expected to be a monoculture of grass kept lush, green, weed-free and tightly cropped throughout the growing season.

Continued on back

What is a groundcover?

By Justin Evertson

ground cover *n.* Low-growing plants that form a dense, extensive growth and tend to prevent soil erosion. (*American Heritage Dictionary*, 1982)

As its name implies, a groundcover is just that—a low-growing plant that covers the ground. From a dictionary we also learn that a groundcover is typically dense in habit and tends to prevent soil erosion. Therein lies a conundrum. Depending on one's point of view a groundcover could be almost any plant imaginable. When we travel high above the earth's surface in an airplane, for example, large trees become ground covers. They form dense canopies and they certainly help prevent soil erosion. Conversely, from the perspective of our lives on the ground, only those plants that we see radiating forth below us would seem to qualify.

For the purposes of this publication we will settle on a common-sense definition for a groundcover that includes primarily those plants less than knee high and which tend to spread horizontally just above the ground plane in a natural fashion. Such spreading can occur in numerous ways such as by seeding, rhizomes, stolons (stems or runners growing above ground), branch elongation and branch rooting.

Groundcovers can have a myriad of uses and benefits. They save time by crowding weeds, shading the soil surface, conserving water as living mulch and just generally making the garden less work. Best of all, they don't have to be mowed and can be used on slopes where mowing is impractical. In this issue of *The Seed* we explore some new and seldom-seen uses for groundcovers, such as for living mulch around trees and shrubs and as alternatives to the traditional turfgrass lawn.

Nebraska Statewide Arboretum
P.O. Box 830715
University of Nebraska
Lincoln, NE 68583-0715
Phone: 402-472-2971
arboretum.unl.edu

Nonprofit Org.
U.S. Postage PAID
Permit 46
Lincoln, NE

Inside:

"Bare earth bothers me because nature leaves nothing bare that will support life. Often I have reflected this is why men worry about baldness. In any case, ground in the garden that is not planted solid with ornamental plants will soon be solid with weeds, so the point is to cover the ground."
Henry Mitchell,
The Essential

Spring 2005
arboretum.unl.edu

IANR

Groundcovers for Sun

Plumbago--Ceratostigma plumbaginoides; and candytuft--Iberis sempervirens.

- *Achillea millefolium,* common yarrow. Fern-like foliage with white, flat-topped flower clusters in early summer; moderate spreading from fibrous rhizomes; can be mowed back after flowering to renew. Introduced varieties offer flowers in various shades of pink, salmon, red and orange.
- *Anemone canadensis*, meadow anemone. Attractive dark green, deeply divided leaves form dense colonies to 2' high; 1" white flowers in late May; spreads by rhizomes rapidly in shady areas; mow back in August for a flush of new growth.
- *Antenneria neglecta*, plains pussytoes. Handsome silver-gray leaves form a dense mat of growth from creeping stolons; excellent for hot, sunny areas and between flagstone; combine with Turkish veronica, creeping thyme or desert globe mallow; creeping in heavy soil and moderate in loose soil.

Artemisia. Silver gray foliage; fine textured plants make a great filler in the perennial border; 'Sea Foam' and 'Silver Brocade' are excellent selections; great for dry, well-drained areas.

- *Aster oblongifolius*, aromatic aster. Forms dense plants to 20" high covered with violet-blue flowers in September; lower leaves often shed before flowering; creeping rhizomes; needs sunny, dry conditions.

Aurinia saxatilis, basket of gold. Clusters of brilliant yellow flowers in early spring; 10" gray-green foliage mat; allow to reseed before shearing back; great combined with creeping phlox; drought-tolerant.

- *Callirhoe involucrata*, purple poppy mallow. Low-growing cut-leaf native to 12" tall and 4' wide; dies back to crown each year; bright purple cup-shaped flowers all summer; easy, drought tolerant; rapid cover.

Cerastium tomentosum, snow in summer. Low spreading, silver-gray carpet; masses of white flowers in summer, 3-4" in bloom; suffers in wet, poorly drained soils; moderate spreader in loose, dry soils.

Ceratostigma plumbaginoides, plumbago. Glossy green foliage emerges late; gentian blue flowers in late summer to frost; 12" high; grows in full sun to part shade; moderate spreader in good garden soils.

Clematis x *jouiniana* 'Mrs. Robert Brydon.' A vigorous, non-clinging vine with many small bluish-white flowers in early fall; makes a nice 2' high groundcover when allowed to grow between large shrubs.

- *Conoclinium coelestinum,* mist flower. Hardy Great Plains native with clusters of bright blue "ageratum" flowers in fall on 18" stems; plants spread slowly by creeping rhizomes and from seed.

Euphorbia cyparissias, cypress spurge. Gray-green, ferny foliage topped with sulphur yellow flowers; spreads rapidly by underground stolons; plant in a confined space and dry soils.

Euphorbia polychroma, cushion spurge. A bushy plant that forms a 15-18" wide cushion; covered with bright yellow flower bracts in spring; easy to grow; will spread by seed in open ground.

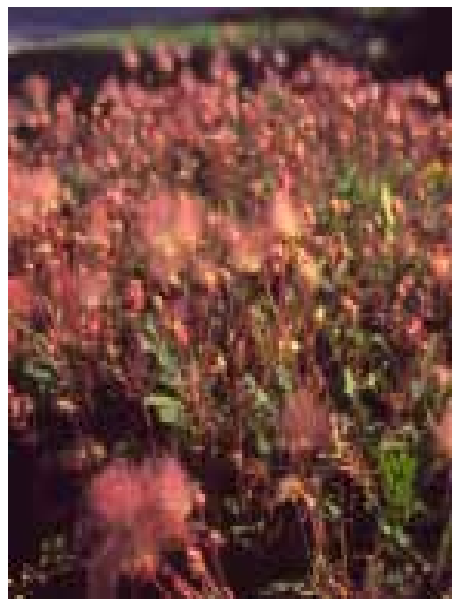
- *Fragaria virginiana,* wild strawberry. Strawberry-like leaves and flowers on this rapid spreading native; great combined with bracted spiderwort for they like similar conditions; sun to shade, moist to dry areas
- *Geum triflorum,* prairie smoke. Nodding pink flowers followed by feathery seed heads on this 15" beauty; creeps by rhizomes to form dense colonies; quite adaptable to soil and moisture.

Iberis sempervirens, candytuft. Showy white flowers can be sheared back after spring bloom for a bushier growth; dark green narrow leaves are evergreen in winter; likes sunny, well-drained conditions.

Lysimachia clethroides, gooseneck loosestrife. White flower spikes on 2' arching stems; moderate to rapid spreader; attractive foliage turns reddish in fall; great between large shrubs; moist to dry, sun or shade.

Marrubium rotundifolium, silver horehound. Silvery 4" evergreen mat with spoon-shaped leaves; needs well-drained dry location; creeps slowly.

Nepeta × *faassenii*, Faassen's catmint. Easy to grow and very reliable; low, spreading habit, that is not invasive; silvery-green foliage and masses of long-blooming blue to lavender blue flowers; reliable cultivars include 'Blue Wonder', 'Walker's Low" and 'Snowflake' (white flowers).



Prairie smoke--Geum triflorum.

- *Oenothera speciosa*, evening primrose. Lovely, large 2" pink flowers over a long period in late spring; tough, carefree plant to 18"; rapid spreading, aggressive; plant in confined space.

Phlox subulata, creeping phlox. Dresses up a walkway with sheets of pink, lavender, white or rose.

Rudbeckia fulgida 'Goldsturm', black-eyed-susan. Large deep yellow flowers with black centers bloom profusely from June through frost; forms a nicely branched 2' rounded plant; will spread gradually from rhizomes; not recommended for extremely dry soils.

Salvia nemerosa, meadow sage. Although not wide-spreading, many varieties can be used in mass as reliable groundcovers; proven cultivars include 'May Night', 'Blue Queen' and 'Marcus' with deep blue flowers on 12" spreading plants.

Saponaria ocymoides, soapwort. Abundant pink flowers in loose sprays in May; leafy plants form dense 12" plants to 2' wide; shear back after flowering or allow to reseed for groundcover; sunny, well-drained areas.

Sedum, low varieties. The small stature and miniature leave of the mat-forming sedums make them excellent living mulch in xeric plantings and rock gardens; a moderate spreader in sun, well-drained areas.

- *Sphaeralcea coccinea,* scarlet globe mallow. Attractive gray-green leaves give rise to clusters of salmon-colored flowers in late May; spreads moderately by creeping roots to form colonies; try with prairie junegrass and *Oenothera macrocarpa* var. *incana*. This sprawling primrose forms a nice groundcover.

Stachys byzantina, lamb's ears. The texture of this sun-loving plant is a nice contrast to other plants with its large velvety white, woolly leaves; moderate to aggressive spreader; perfect for confined hell strips.

- *Thermopsis rhombifolia*, goldenpea. This beauty has bright yellow pea-like flowers in loose clusters in early spring; strong rhizomes form loose colonies; western Nebraska native; prefers dry, well-drained soils.

Thymus spp. There are a number of outstanding thyme selections well suited as a groundcover for dry, well-drained areas. Caraway, mother of thyme, nutmeg and red creeping are all good prostrate forms.

- *Tradescantia bracteata*, bracted spiderwort. Grass-like leaves and blue-violet flowers clustered toward the stem tips; this spiderwort moderately spreads by rhizomes; lovely with wild strawberry; 16" high.

Veronica, speedwell or Turkish veronica.

Native Groundcovers

If you're looking for groundcovers that will handle the climate conditions of your region, consider using ones native to the Great Plains, which have been marked . This results in plantings that take less time and resources to maintain. Keep in mind, however, that many of our yard soils are actually subsoils dug out for a basement and compacted around the site, in which case it's important to break up the soil and add amendments such as compost or topsoil.

Groundcover Prairie Grasses for Sun

Prairie dropseed, Sporobolis heterolepis.

Bouteloua gracilis, blue grama. A creeping, sod-forming native to 18" when in flower; roots go deep.

Bouteloua curtipendula, side-oats grama. Moderate spreader with attractive seed heads to 3'.

Buchloe dactyloides, buffalo grass. Not just a prairie grass anymore; breeding work has provided improved turfgrass type selections for dry, non-traffic areas.

Elymus virginiana, silky wildrye. Shiny leaves and rye-like seed heads to 2'; reseeds readily for shade.

Panicum virgatum, switchgrass. Moderate spreader with robust rhizomes; 5-6' plants need space.

Sporobolus heterolepis, prairie dropseed. A 2' bunchgrass excellent planted in mass.

Schizachyrium scoparium, little bluestem. This 2-3' bunchgrass will reseed readily to create a mass.

Groundcovers for Shade

Although it takes a little time and patience to establish groundcovers, these plants form a ground-hugging companion for taller plants and trees. For many gardeners, they're the best answer for problem areas that are too shady, dry or moist for anything but weeds. They generally grow where grass cannot and are an interesting alternative to the traditional mulch beds. The following plants are some terrific shade-loving groundcovers, tried and true or long underused. The plants are listed as rapid, moderate and creeping to describe how fast they spread.

Aegopodium podagraria, bishop's weed. Dense, creamy-white and green-foliaged groundcover; spreads rapidly by underground rhizomes; white, flat-topped flowers in June; great under trees.

Ajuga reptans, bugleweed. Purple leaves stay low to the ground; blue flower spikes to 8"; moist soil; moderate spreader.

Alchemilla mollis, lady's mantle. Gray-green, mat forming foliage; 12-18" wide; clumps of tiny yellow-green starry flowers extend above the foliage in late spring; slow.

Anemone canadensis, meadow anemone. See description in "Sun."

Anemone sylvestris, snowdrops. An 8" mat of attractive light green leaves give rise to 2" dainty white flowers on stems to 18"; requires light soil and part shade; moderate to aggressive but easy to remove.

Bergenia cordifolia, heartleaf bergenia. Large, glossy, dark green leaves turn reddish in fall, semi-evergreen in winter; rose-pink flowers in spring; creeps slowly by rhizomes.

Asarum canadense, wild ginger. A woodland native with heart-shaped leaves; needs moist, organic soils.

Brunnera macrophylla. Handsome, lush foliage topped with sprays of small sky-blue, forget-me-not flowers in spring; needs rich, moist, organic soils.

Carex plantaginea, plantain sedge. An evergreen clump-former with wide green foliage and seersucker texture. This grass-like plant tops out at about 8"; moist or dry soils; creeping spreader.

Convallaria majalis, lily-of-the-valley. Fragrant, white nodding bells in spring; attractive lance-shaped leaves to 8"; tough, easy to grow in moist or dry shade; moderate spreader.

Corydalis lutea. Small, yellow tubular flowers cover plants in late spring to summer; gray, lacy foliage to 12" high; spreads moderately by rhizomes.

Epimedium. 'Sulphureum'. Dainty flowers show off in the spring and resist deer. Takes its time to spread to 3-4'.

Euonymus fortunei, wintercreeper. No stranger to the garden, especially sunny spots. Give it some elbow room as one plant can spread rapidly to 3'; refined selections available.

Galium odoratum, sweet woodruff. Shiny, whorled deep green leaves to 12"; small white flowers; prefers moist, organic soils; moderate spreader.

Geranium sanguineum, bloody cranesbill. Bowl-shaped magenta flowers cover plants; deeply cut foliage can turn blood red in fall; durable workhorse for the border; shear back in summer; creeping rhizomes.

Hedera helix, English ivy. Heart-shaped leaves cling to walls, fences and slopes; moist or dry; evergreen; moderate to rapid spreader.

Heuchera spp., coral bells. Reliable, easy to grow and drought tolerant when established; low, mounded habit from 10-20" wide with a tendency to spread slowly from the base; most varieties selected for variegated or mottled foliage ranging from wine-colored to purple-green to chocolate and many shades in between.

Hosta. Many compact forms available for edging, borders and groundcover; tolerates dry shade.

Houttuynia cordata. 'Chameleon' offers pink, white and green leaves to 15"; 'Plena' has dark green, heart-shaped leaves with white flowers; rapid spreading in moist, organic soils; tolerates boggy soils.

Lamium maculatum, spotted deadnettle. Hardy choice for summer color in shade or partial sun; moderate.

Lamiastrum galeobdolon 'Hermann's Pride', yellow archangel. Grows slow in shade and dry conditions.

Lysimachia nummularia, moneywort. Green, ruffly foliage mat with small yellow flowers; excellent groundcover, moderate spreader.

Pachysandra procumbens, Allegheny spurge. Handles tree roots and spreads indefinitely in loose soil; moist or dry; evergreen.

Pachysandra terminalis, Japanese spurge. Attractive olive-green leaves spread to form a 6-10" high dense carpet of green; creamy white flowers in May; reliable and easy to grow; rapid.

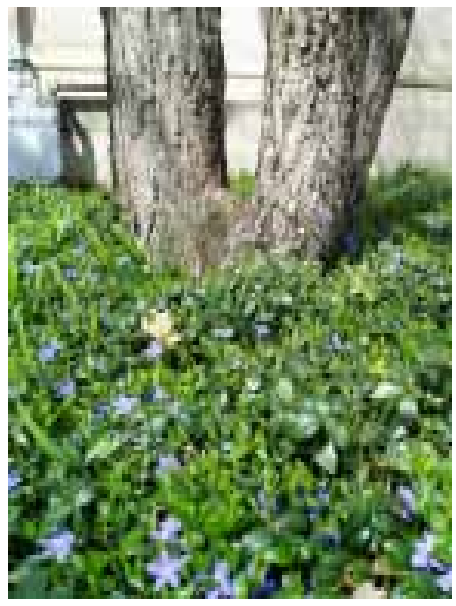
Polygonatum biflorum, Solomon's seal. Solitary, arching stems to 3'; leaves arranged along stalk; creeps from thick, horizontal rhizome to form colonies; tolerates dry shade once established.

Smilacina stellata, false Solomon's seal. Stems arching to 1-2' with lance-shaped leaves clasping stem; small white flowers top stems in spring; creeps from rhizomes to form colonies; prefers moist soils.

Symphytum grandiflorum, comfrey. Bushy 18" plants with large ovate leaves; small, sky blue tubular flowers top the plants in spring; creeping to moderate spreader; tough, durable for dry shade.

Vinca minor. An evergreen that offers lavender-blue, star-like flowers; dry or moist soils; moderate spreader.

Waldsteinia ternata, barren strawberry. A nice groundcover, resembling a small version of a strawberry plant; shiny evergreen leaves, bright yellow flowers in spring; heavy shade to part shade; creeping.



Vinca minor (top); bloody cranesbill—Geranium sanguineum; and Solomon's seal—*Polygonatum biflorum*.

Woody Groundcovers

Woody plants do not die back to the ground over winter, but will leaf out from above ground on woody stems. Some woody plants can spread through rhizomes or layering (rooting where branches touch the ground) and quickly fill in an area, providing valuable, yet attractive, erosion control. Other woody plants can be planted in masses to give a groundcover effect. Once established, groundcovers can be a low-maintenance solution for areas not appropriate for other plants, and can be repeated to visually provide unity to a landscape.

Cotoneaster adpressus, creeping cotoneaster. White flowers in spring and red fruits in fall; 1-1 ½' high and 4-6' wide. Full sun.

Euonymus fortunei, wintercreeper. See description in "Shade."

Juniperus, creeping juniper. Many cultivars of varying height and forms. 'Blue Chip', 'Broadmoor', 'Andorra' and 'Prince of Wales' are among the best. Place in full sun.

Lonicera japonica 'Halliana', Hall's honeysuckle. Only included here as a warning because it can spread rapidly; must be confined or it will become a pest that is almost impossible to kill.

Mahonia repens, creeping mahonia. This western native is a low, stoloniferous, evergreen groundcover with holly-like leaves that turn reddish purple in fall and winter; a durable plant that grows in sun or shade; creeps slowly; fragrant yellow flower clusters in spring; 15-18" high.

Microbiota decussata, Russian arborvitae (cypress). Low growing, spreading evergreen similar to juniper; attractive layered foliage fades to a purple-bronze in winter; tolerates shade better than most junipers; 1-2' high and 6-8' wide.

Prunus besseyii 'Pawnee Buttes', Pawnee Buttes western sand cherry. A low, creeping western native 12-18" high and 6-8' wide; glossy, silver-green foliage; spring white flowers; prefers hot, dry.

Rhus aromatica 'Gro-Low', fragrant sumac. Low, wide-spreading habit, 2' high and 6-8' wide. Excellent glossy foliage. Early yellow flowers; fast-growing cover; adaptable; tough.

Rosa species, creeping rose. 'Memorial', 'Red Meidiland', 'Pink Meidiland'. A rambler that lies flat on the ground. Canes root where they touch soil; great on slopes; likes sun.

Salix caprea 'Weeping Sally' willow. This beauty forms a large trailing mound that serves as an excellent groundcover; incredible texture makes this a valuable landscape plant.

Stephanandra incisa 'Crispa'. May be pruned or mowed to keep below 18"; grows 18-36" high, forming a thick tangle of stems. Prefers full sun or light shade. Small yellowish-white flowers are not showy and borne in loose panicles. Tends to root wherever stems touch soil; develops chlorosis in high pH soils.

Symphoricarpos albus, common snowberry. Deciduous shrub 3-4' high. Densely fine and twiggy. Leaves bluish-green. Fruit is white, showy, ripening September-November. Tolerant of any soil, full sun to medium shade, suckers profusely and spreads.

Symphoricarpos orbiculatus, coralberry. This tough native develops into a spreading, arching shrub 2-4' high. Clusters of showy purplish red fruit line themselves all along the thin stems and persist all winter; grows in sun or shade; suckers profusely.

Creeping juniper—*Juniperus*; and coralberry—*Symphoricorpos orbiculatus*.

Establishing Groundcovers

When planting groundcovers it's important to learn and remember the environment in which the plants evolved. By paying close attention to where plants come from in nature—dry, upland prairie, rocky outcroppings, fertile lowlands or moist, rich woodlands—one can try to provide them with the growing conditions they were used to in nature. Landscapes that consist of heat-loving, drought-tolerant trees and shrubs require a groundcover that can take these same conditions.

Site Preparation

Many groundcovers develop crown rot in heavy clay soils that don't drain well. Adding coarse organic matter, such as composted or aged manure, peat moss or compost can improve the drainage of heavy clay soils and increase the water-holding capacity of light sandy soils. Rototill or spade the soil to an 8" depth and thoroughly incorporate the organic matter at a rate of 1 cubic yard (three full wheelbarrows) per 100 square feet. Many successful gardeners prefer raising the planting area above the existing grade to form a slight berm or crown.

Soil preparation can cause serious erosion on steep slopes. Working the soil across the slopes in 12- to 24' wide bands alternated with undisturbed soil will help reduce erosion. Mulching the slope with a fiber mat will further reduce erosion while conserving moisture and reducing weed competition.

Slopes that would be difficult to mow are excellent sites for groundcovers.

Planting

Groundcovers should be planted in the spring or fall. Containerized stock can be planted anytime during the growing season if proper planting and maintenance procedures are followed.

The number of plants needed depends on the spacing of the individual plants, their rate of growth and how fast you want the space to fill in. You may want to densely plant a small, highly visible area for rapid fill, but a large area may require sparser planting with several years being allowed for covering the site.

To estimate the number of plants needed, first determine the size of the site in square feet. Consider the average width of the species and the spacing of individual plants to determine the approximate number of plants you will need.

Weed Control

Control weeds to enable the newly planted groundcover to form a dense mat. When properly established, groundcovers can compete with many weeds. Hand weeding is effective, but can be time consuming.

Preemergent herbicides can be used to control weeds in large plantings. Always read and follow label directions. If perennial weeds such as bindweed or dandelions are a problem, consider multiple applications of post-emergent herbicide to eliminate these weeds completely before planting any groundcovers.

Maintenance

A well-established groundcover generally requires less maintenance than the typical turfgrass lawn. Groundcovers are not totally maintenance-free, nor will they always tolerate conditions that will not support turf.

Pruning will stimulate new growth on most groundcovers. At planting time, prune back the growth by one half (more on trailing plants such as ivy or periwinkle) to promote branching.

Many common groundcovers may become overgrown in time, with thick, tangled growth. Periodic pruning will control groundcovers and keep them vigorous, neat and healthy. A mower set very high, nylon cord trimmer, hedge shears or hand clippers can be used. Mowing checks excessive growth, thins out thick, unwanted stems, and can even help to rejuvenate old, less vigorous groundcovers.

Mulching

Once the plants are in place it's important to mulch around the individual plants to cover the exposed soil. Mulching serves many purposes in a groundcover planting. A 1-3" layer of mulch around the plants helps control weeds, maintains a more constant soil temperature, conserves soil moisture and reduces erosion on slopes. Compost, leaf mold, well-rotted manure, bark or wood chips and peat moss, can be used as mulches. Make sure the mulch isn't too thick to enable plants that spread by runners to come in contact with soil and root.

Mulching also helps to protect plants from winter injury resulting from uneven soil temperatures and soil heaving. Most evergreen groundcovers need protection from winter desiccation (drying). Apply mulch loosely after the ground has frozen and remove it in the spring before growth begins.

Groundcover Alternatives continued from front

Almost anywhere it is grown, and especially in the central U.S., carpet-like turfgrass requires significant efforts to maintain including regular mowing, edge trimming, fertilizer treatments, yearly pesticide applications, aeration, de-thatching, and reseeding. Amazingly, the effort and expense required to maintain the lawn in this ideal form have become broadly accepted throughout American society.

Unfortunately, many lawn maintenance activities can have serious negative consequences for the broader landscape. Misapplied herbicides can harm non-target landscape plants; insecticides and other pesticides kill or injure many beneficial insects and wildlife; careless use of mowers and string trimmers frequently causes severe injuries to trees and other landscape plants; and the many gas-powered machines used for lawn care contribute to air and noise pollution.

Lingering drought throughout much of the U.S. in recent years has brought into focus another problem associated with lawn upkeep—traditional lawns typically require significant supplemental moisture to be kept lush and green during the growing season. In fact, in the central U.S., it is estimated that over 70 percent of a community's summer water use is for turf irrigation (Amy Vickers, *Handbook of Water Conservation*, 2001). At a time when rivers are running dry and groundwater levels are dropping, lawn watering restrictionis are becoming common in communities across the Central U.S.

A growing trend for many people is to develop lawns that require much fewer inputs to be maintained. The solutions range from simple modification of maintenance strategies for traditional turf to new concepts that emphasize non-traditional species of plants including non-grass groundcovers. A common theme emerging in this new effort is the need to broaden the diversity of plants in any lawn planting. The idea is based on the old rule that nature tends toward diversity over time. In fact almost any healthy natural system is replete with a wide variety of plants, animals, insects and microbial life. In some ways modern lawn care has become a fight against this natural tendency.

For those who desire a more traditional lawn but wish to cut back on maintenance inputs, a simple solution is to just be more accepting of a less than perfect appearance. Instead of striving for a lush green look throughout the growing season, the lawn is allowed to go dormant or are watered only enough to survive the hottest and driest periods of the summer. Such lawns are typically mowed a little higher than most, the clippings are allowed to stay on the grass, fertilizers are minimally applied and pesticides are used only to control severe problems. Many people have come to accept benign weeds and hand-pull or spot spray the few that might cause serious problems.

Taking the relaxed approach a step further, other people are now once again mixing clovers into their lawns. This approach is a return to the time before chemical broadleaf weed control when it was quite common to have clover included in a planting mix. Clover has several benefits including its ability to add nitrogen to the soil, its deeper roots bestow drought tolerance and help break up compacted soils, it can withstand foot traffic and it can be mowed at the same height as traditional turf. Some people have also begun to include other low growing non-grass species in their lawns such as trefoil, violets (especially where there is some shade) and scilla (a grass-like bulb with blue flowers in spring) among others. In such lawns it is much easier to tolerate a few dandelions, plantains, black medic or other benign weeds.

Spring bulbs like *Scilla siberica* can provide color while slower-growing perennials begin to emerge.

Where there is full sun some low-growing native prairie grasses have become popular lawn alternatives. Most commonly used is buffalo grass (*Buchloe dactyloides*) of which many cultivars and varieties have been developed for the plains states. Buffalo grass naturally grows less than 12" high and will spread by both surface runners (stolons) and seed. Blue grama (*Bouteloua gracilis*) is another plains native that can be combined with buffalo grass in a lawn. Blue grama is primarily a clump former that will do best when mowed higher and less frequently. Both buffalo grass and blue grama are extremely drought-tolerant.

Even more so than traditional lawn grasses, buffalo grass and blue grama allow for the inclusion of many non-grass species. One way to think of such a planting is as a shortgrass meadow that would be mowed high (8"-12" or so) and no more than a few times a season. Purple poppy mallow, pasqueflower, purple prairie clover, anemone, prairie coneflower, plains purple coneflower, yarrow, heath aster, dotted gayfeather, wild alfalfa and prairie larkspur are just some of the species that could be used in such a planting. Indeed just about any tough, low-growing perennial could be used. Those that are native would give an air of authenticity to the prairie meadow theme.

A bold alternative to the traditional lawn is to eliminate turf grass entirely and use masses of non-turf ground covers instead. This "groundcover lawn" should only be used where foot traffic is not expected or desired. A gppd way to envision a groundcover lawn is to plant in drifts where different masses of plants are allowed to flow naturally from one to another. Some plants may end up mixing together while others might remain as one mass. Although turfgrass would not be included, ornamental grasses could be included for textural contrast and winter appeal.

A wide variety of plants could be considered for a groundcover lawn. Lawn alternatives for sunny areas include: *Achillea*, *Aurinia saxatilis*, *Cerastium tomentosum, Euonymus fortunei*, *Juniperus*, *Nepeta*, *Sedum, Stachys byzantina* and *Thymus.*

Lawn alternatives for shade or part shade include: *Aegopodium podagraria*, *Epimedium*, *Galium odoratum*, *Lamium maculatum, Lysimachia nummularia*, *Pachysandra terminalis* and *Vinca minor.*

Despite all its benefits, the non-traditional lawn in most of suburbia is rarer than a one-stall garage. Most people are just not yet willing to part with or modify their perfect green carpets. In time, watering restrictions, higher water costs and more pesticide restrictions will likely push more people into the non-traditional fold. In the mean time, those forward thinkers who are comfortable trying new things can help demonstrate to their neighbors that the lawn can be both beautiful and biologically diverse while also being easier and cheaper to maintain.